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SEPTEMBER 18, 1948

TECHNOLOGY DEPARTMENT

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

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A SCIENCE SERVICE PUBLICATION

$5.50 A YEAR

VOL. 54 NO. 12.

ASTRONOMY

Stars Supra-National

Dr. Harlow Shapley, in retiring presidential A.A.A.S. address, says scientists can lead world in cooperation across national boundaries to peace and progress.

► SCIENTIFIC cooperation across national boundaries can be used to lead the world into an era of peace and human progress, Dr. Harlow Shapley, director of the Harvard College Observatory, declared in his address as retiring president of the American Association for the Advancement of Science which opened that organization's centennial meeting at Washington (Sept. 13).

Supra-nationalism is "simple and effective" for scientists, Dr. Shapley said, calling upon scientists to show how mankind can survive the present crisis.

An international observatory, a joint enterprise of Eire, the United States and North Ireland, will begin photographing the stars from South Africa a year from now. This will be "symbolic of the willingness and desire to cooperate across religious and political boundaries when led by the stars."

A new wide-angled Baker-Schmidt telescope of great power will be mounted at the Harvard station in the Orange Free State, South Africa, by agreement between Dunsink Observatory of the Eire Government, the Armagh Observatory of the Arch-Bishopric of North Ireland and Harvard.

Science must go to the heavens for information that can not be obtained in earthly laboratories, Dr. Shapley said.

"We can now build and split atoms in our laboratories," Dr. Shapley said, "but there is nothing we can do with the galaxies, those gigantic wheel-shaped star systems, strewn by the millions throughout the recently discovered outer spaces. Nor can we do anything with the smaller sidereal systems, the beautiful globular clusters, except to study them and learn of their enormous populations of giant stars, measure their times, energies, positions, and motions, guess at their origins and destinies, and bring back to the philosophies and religions the raw materials useful for the reorientation of man and his works in the new world of knowledge and intellectual opportunity.

"These great spiral galaxies are probably similar in form to the one in which we are located. Others are irregular, like the nearby clouds of Magellan, to which we at the Harvard Observatory have paid much attention for the past 50 years. Still other galaxies are spheroidal and symmetrical, looking much like super-giant globular clusters, which indeed they may be."

A month ago about 40 astronomers from a dozen countries, who were particularly interested in the problems of galaxies, met in Zurich, Switzerland, to talk over the problems demanding further study, Dr. Shapley reported.

"There was no jockeying for national prestige, no manipulating of small observatories, no struts about manifest destinies and national aspirations," he said. "It was an assembly of those representing a unified world curiosity, a unified desire to understand the universe, a united front in a special battle against our common enemy, ignorance."

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PHYSIOLOGY

Measure Muscle Injury

By using cathode ray tubes and amplifiers, a new technique has been devised which will enable doctors to predict whether muscles will recover from paralysis.

► DOCTORS can now predict which muscles affected by polio will return to normal function, the American Congress on Physical Medicine was told in a meeting in Washington.

The new method combines the use of cathode ray tubes in television sets and amplifiers which record the electrical impulses of the muscles. A picture can thus be made of the electric currents in human muscles in the form of ink-drawn lines on a running tape, as visible electrical impulses on a screen, or even as audible sounds over a loud speaker, as the doctor may prefer. This apparatus is known as an electromyograph.

Its first application to clinical work was described by Dr. O. Leonard Huddleston of the University of Southern California School of Medicine; Margaret Clare, research associate, and Dr. Alex Harell, both of Washington University School of Medicine, St. Louis; and Dr. Leonard I. Yamshon of Columbia University.

Many other uses are foreseen for the new method. Because it will enable doctors to determine more precisely the injury to nerves and muscles, they can judge whether a paralysis is caused by nerve injury, muscular disease, or whether it is a result of hysteria.

Besides aiding in disease diagnosis, it can also help in the recovery of patients. Dr. Huddleston pointed out that it is useful in training patients to use their muscles after illnesses. By enabling the patient to see or hear what is happening, he can concentrate on contracting the right muscles during training.

Dr. Huddleston predicted, "The electromyograph will become as important in studying the diseases of the muscles of the body as the electrocardiograph has been in studying the diseases of the heart."

It is also expected to be important in giving legal evidence in actions involving insurance and liability claims.

Science News Letter, September 18, 1948

PSYCHOLOGY

Reading Courses To Speed "Paper Work" of Air Force

► THOUSANDS of Air Force officers will in the future be able to read their way down through their mountains of "paper work" with much greater speed and ease.

The reading of officers in the Air University, Maxwell Air Force Base, Montgomery, Ala., was speeded up by special training from an average of 250 words a minute to approximately 600 words a minute. Dr. Fred Couey, of the Air University, told the meeting of the American Psychological Association in Boston that comprehension remained at the same level.

At first the officers were permitted to volunteer for the reading-speeding training. Thirty were trained in this preliminary program. Later it was required and 115 officers were given the advantage of the increased reading speed. The training was just as effective when it was a "must" as when the men volunteered.

In the coming year, it is planned to put 5,000 officers through the training program.

The training is not time-consuming. The men work only three hours a week. Half of each hourly period is spent at an instrument that exposes slides containing numbers for fractions of a second. The time of "glance" permitted to read the number is cut down from 1/25 second to only 1/100 second. The size of the number, meantime, is increased from five places to nine places.

The other half of the class is more entertaining. Reading material is selected from the most interesting of current fiction.

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PUBLIC HEALTH

Famine Danger Foreseen

The rapid growth of world population as a result of scientific advances makes it doubtful that food supplies can keep pace, British are warned.

► WORLD POPULATION will grow at an even greater rate than it has in recent years, bringing danger of famine, the British Association for the Advancement of Science, meeting in Brighton, England, was warned by Sir Henry Tizard in his presidential address. He is chairman of the British Advisory Council on Scientific Policy and Defense Research Policy Committee.

At least 20,000,000 people are added to the population of the world each year and it is conceivable that in another 70 years or even less the world population will have doubled.

Population is increasing where the world already has too many people, Sir Henry said. India's population is gaining 5,000,000 people a year. Egypt's masses, where there are 2,000 people for every square mile of cultivated land, are on the increase because there it pays to have children who work at an early age to the profit of their parents.

In large part the increase in population is due to new methods of preventive medicine. How this operates was shown by an experience reported by Sir Henry. In 1944 a British special mission visited British Guiana, population roughly 400,000, which has remained stationary for the last 20 years. Two-thirds of the population used to live under conditions of severe endemic malaria. Birth rate was low, and infant and adult mortality high.

In 1945, through use of DDT and other methods, the mosquitoes carrying malaria, and also yellow fever and filariasis, were kept under continuous control. The annual cost was less than a dollar per person.

The death rate was reduced, the birth rate doubled and the population is increasing 10% annually. A suburb of the principal city, Georgetown, with a population of about 3,000, had a death rate equal to the birth rate in the years 1933 through 1944. Infant mortality was about 250 per thousand. It rose to 350 in 1944. By the end of 1947, the birth rate doubled and the infant mortality dropped to 67 per thousand.

"In all countries which have a high standard of education," he said, "the rise in population which follows a rapidly decreasing death rate has been kept in check by a voluntary control of births. As a result the average age of the population has considerably increased, and is increasing. This, in itself, does not yet present any serious problem, for, as the proportion of children is much less than it was, the proportion capable of productive work, between the ages of 15 and 65, is actually somewhat higher. No fundamental difficulty, from this cause, is likely to arise for many years to come.

"But the population of the world as a whole is now increasing by 1% a year, and its distribution is such as to make it extremely doubtful whether the supply of food can keep pace, even with the present low standard of nutrition.

"It is the advance of science that has made this possible. War, pestilence, and famine have kept the population within bounds since the dawn of history. War has ceased to be effective; pestilence is rapidly losing its power; only famine is left as a brake until education takes its place. Is famine inevitable, or will science again come to the rescue, as it has done before?"

Fifty years ago Sir William Crookes, in a similar address to BAAS, warned of the danger of famine. He was then alarmed at the prospective shortage of wheat. The chemist by fixation of nitrogen from the air and the plant breeder by improving varieties of crops came to the rescue.

"Now the day has come when we must grapple again with the problem," Sir Henry said. "We must not encourage the easy thought that some entirely new development in science will solve it quickly. There is nothing in sight comparable with the importance of synthetic fertilizers.

"There are certainly some interesting investigations in progress, for instance the production of food yeasts from molasses, and of fats by the action of micro-organisms on carbohydrates. All that can reasonably be said about these new developments at present is that they show the need for fundamental research in an almost untouched field.

"They are very unlikely to lead to a new and substantial source of supply of food within the next 30 years. So far as this country is concerned we must plan our economy on the assumption that food will be both scarce and dear for many years to come."

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***50,000,000-VOLT X-RAYS**—Heart of a recently completed betatron in the General Electric Research Laboratory, is this glass "doughnut" being examined by Dr. Ernest E. Charlton, head of the X-Ray section. Electrons, emitted from a hot filament inside this vacuum tube, are whirled around thousands of times. As acceleration builds up the magnetic field to its maximum, the orbit of the whirling electrons is shifted and they hit a tungsten target which they missed before. This generates a beam of high-voltage X-rays, and occurs at the rate of 60 times per second.*

ASTRONOMY

Meteorites Not So Old

► THE ANCIENT PLANET, from which were broken all meteorites found on the earth today, was born less than 60,000,000 years ago.

This finding, which reduces the relative age of the parent planet from a top limit of some 7,600,000,000 years to a mere 60,000,000 years, is reported by Dr. Carl August Bauer of the University of Michigan in the PHYSICAL REVIEW (Aug. 15).

Smaller than the earth, this now-disrupted planet once moved in an orbit between those of Mars and Jupiter. This is where the asteroids or minor planets are found today.

This upper limit on the age of the planet can be established because the uranium and thorium contents of the meteorites he studied are sufficient to produce all of its helium in only 60,000,000 years.

Cosmic radiation thus produces helium in meteorites 70 times faster than he had previously predicted, Dr. Bauer explains. This is true because, to agree with his new findings, cosmic radiation has to produce the helium in 60,000,000 years rather than in 4,000,000,000 years, as previously estimated.

"This high rate of production of helium in meteorites, as compared to the calculated rate just outside the earth's atmosphere, may arise from the effect of the sun's general magnetic field, as suggested previously, or from secondary helium-producing processes that have not been considered," Dr. Bauer reports.

The new findings overcome two difficulties:

1. Difference in the helium content of different fragments of the same meteorite.
2. Difference from point to point within the same fragment.

Five Bethany meteorites, all located in a limited region of Great Namaqueland, Southwest Africa, upon examination were found to be similar in structure and composition. But one has been assigned to a different meteorite fall because its helium content is so much greater than the others.

This difference can be more satisfactorily accounted for by assuming that the helium was produced by cosmic radiation, Dr. Bauer explains. In this manner the difference in the helium contents of the various fragments would arise from the difference in their location within the original pre-atmospheric mass.

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Letters To The Editor

Got Our Bees Mixed

Your answer to Mrs. Glick's letter (SNL, Aug. 14) erroneously assigns the role of wood borers to leaf-cutting bees (*Megachile*). Certain species do place their leaf nests in wood burrows previously drilled by beetle larvae or other insects. Their activity in removing frass from the holes may create the impression that they are boring into solid wood.

It is advisable not to attribute unwarranted destructiveness to a group of insects essentially beneficial as pollinators.

Carpenter bees, which are often confused with bumble bees, do drill their nest burrows into wood and may cause structural damage, especially in tropical areas. However, they are good pollinators and should not be persecuted for any minor damage they may cause.—George E. Bohart, Entomologist, Logan, Utah.

Doesn't Sound Right

If you were comparing a rich man and a poor man, you certainly would not say that the poor man was 400 times less rich than the rich man. In the article "Hundred White Dwarfs" (SNL, Sept. 4), you use such expressions as "400 times less luminous," "35 times smaller," "40,000 times smaller," and "25,000 times too faint." It just does not sound right.—Clarence E. Mange, St. Louis, Mo.

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SCIENCE NEWS LETTER
Vol. 54 SEPTEMBER 18, 1948 No. 12

55,500 copies of this issue printed.

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change, please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STAte 4439.

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GENERAL SCIENCE

Smears Endanger Nation

House Committee on Un-American Activities is called threat to atomic energy research; scientists say national security is jeopardized by irresponsible attacks.

➤ AN IMMINENT THREAT to our national security and our entire governmental atomic energy research program has been called to the attention of President Truman and Governor Thomas E. Dewey by eight distinguished physical scientists, all of whom had participated in the government's atomic energy development.

Tactics of the House Committee on Un-American Activities have made employment on atomic energy research so undesirable that "the combined full-time personnel of highly capable scientists and engineers in the various government laboratories is on the verge of reaching a dangerously low level." Scientists shun government employment because of the possibility of being subjected "to irresponsible smears that may ruin them professionally for life". The hope was expressed that "the situation can be remedied before irreparable harm is done."

Scientists Protest

Signing telegrams to the Democratic and Republican Presidential candidates were: Prof. Harrison Brown of the Institute for Nuclear Studies of the University of Chicago; Dr. Karl T. Compton, President of the Massachusetts Institute of Technology and a member of the President's Lovalty Board; Prof. T. R. Hogness, Director of the Institute of Radiobiology and Biophysics, University of Chicago; Prof. Charles C. Lauritsen of the California Institute of Technology; Prof. Philip M. Morse, until recently Director of the Brookhaven National Laboratories; Dr. George B. Pegram, Dean of the Graduate Faculties of Columbia University; Prof. Harold C. Urey, Institute for Nuclear Studies, University of Chicago; and Dean John C. Warner of the Graduate School, Carnegie Institute of Technology.

All united in appraising "the atmosphere which is being created by actions and smearing methods of the House Committee on Un-American Activities" as creating "a situation within which it is becoming increasingly difficult for scientists and engineers to function."

"The Atomic Energy Commission is in no way to blame for the unfortunate situation that now exists," the scientists said. Since its formation, the Commission has worked vigorously to establish adequate centers for our atomic research. But the Atomic Energy Commission has been needlessly hampered because atomic energy has unfortunately become a 'political football'. As a result the commission has had to adjust its own workings to the atmosphere created by the Un-American Activities Committee."

It was pointed out that of the 150 senior American scientists mentioned in the famous Smyth Report, an account of the government's wartime atomic energy program, "fewer than 10% are now devoting their full energies to the various government atomic energy programs." It can be expected, the scientists asserted, "that the tactics of the Un-American Activities Committee, if they continue as in the past, will make the situation even more acute."

The messages asserted:

"With the greatest respect to those relatively few excellent men who are now attempting to carry out adequate programs at Brookhaven, Berkeley, Argonne, Los Alamos, Hanford and Oak Ridge, we are forced to the conclusion that the combined full-time personnel of highly capable scientists and engineers in the various laboratories is on the verge of reaching a dangerously low level."

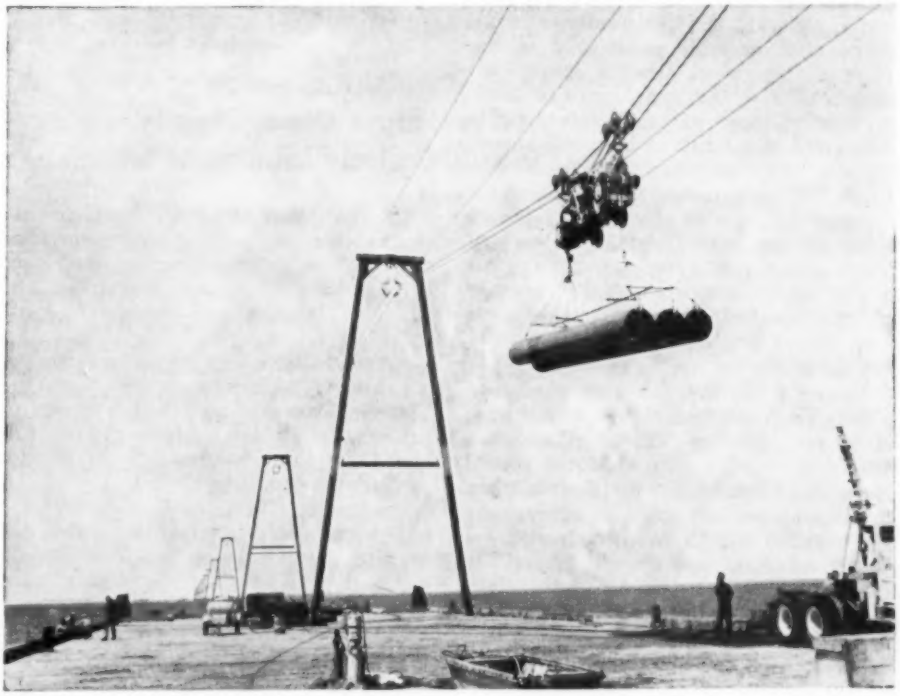
Many former workers on the atomic energy project have not remained "because they have found it increasingly difficult to reconcile themselves to government employment on secret projects where they are looked upon by groups such as the Un-American Activities Committee as men not to be trusted, where they must subject themselves to the possibility of irresponsible smears that may ruin them professionally for life. In many cases the men prefer to work elsewhere for considerably lower salaries on research programs completely unconnected with our atomic endeavors."

The climax of the Committee attacks on the scientists was reached this spring, the statement said, when the Committee issued its attack against Dr. Edward U. Condon.

"That attack was so repugnant to scientists that it will be years before the damage can be undone," it was stated. "And in the face of rumors of attacks yet to come, it will become increasingly difficult to retain top scientists in government service."

Conditions for Research

The scientists called upon President Truman and Governor Dewey to consider that "No nation without adequate scientific resources can hope for any degree of security in the event of another war. In the face of this fact, it is important that the leaders of our nation attempt to understand the conditions under which scientific research can be and cannot be done. In particular, if our nation is to have a vigorous government research program, the



TRIP OVER PERSIAN GULF—This skyhook carries tons of steel pipe from vessel to supply base, at Ras el Mishaab, Saudi Arabia. Man-operated, it is equipped with a two-way radio for communciation with shore office. The three-mile course along overhead cables is covered in only five minutes.

unhealthy atmosphere that has been created by the Un-American Activities Committee must be removed."

They urged President Truman "to investigate this situation, and then direct your powers in an attempt to secure a remedy."

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GENERAL SCIENCE

"No Brains, No Security"

The following editorial under the title "No Brains, No Security" from the New York Star for Sept. 10 is reprinted by permission:

➤ THERE is a nice touch of irony in the telegram eight outstanding scientists sent to President Truman and Governor Dewey to protest the smear tactics of the Thomas Committee. The Committee, having decked itself out in the garb of guardian of our national security and political mores, is inclined to answer each protest with the discovery of a new "spy ring." It defends its methods on the grounds that, though occasionally the innocent may suffer, roughshod tactics are necessary to protect the majority. But now in the crucible of the laboratory, where much of our security lies, the Committee has been weighed and found wanting.

The scientists said they had no real objection to a reasonable and competent inquiry for the sake of real security. But—and this was the determined, cold note in their telegrams—the hysterical outbursts of the Committee were causing many able scientists to avoid returning to or going into government service. Within memory of most of us, and presumably of the Thomas Committee, are the magnificent contributions to our atomic energy development by those scientists who, true to their creed of the rule of light and reason, fled the megalomaniacal hysteria of Nazism's late and unlamented leader. What better proof is there that security lies in access to the ablest talent, the brightest minds of our day? And conversely, what greater threat to our security than a group of investigators whose dimwitted tactics keep out of government service some of our finest brains?

Almost as the scientists were protesting, a prize example of what they were driving at came from the Thomas Committee. Even the usually respectful and careful Associated Press fell for the cheap attempt to discredit a solidly scientific project. An AP story on the Committee's hunt for a "third spy ring" led off this way: "The House Committee on Un-American Affairs is tracking down a report that an international group of scientists plans to star gaze from the middle of the Belgian Congo uranium fields." Note how "international group" is tossed in with "star gaze" to suggest something at once sinister and daffy about a project in a land of chattering Geiger counters—and monkeys.

On down in the story one learns on the authority of that eminent Republican scientist from Pennsylvania—Rep. McDowell—that some $9,000,000 is to be spent on an astronomical laboratory to be used by French, Dutch and Belgian, but NOT Russian scientists, in the midst of the Congo's most uranium-rich terrain. The Committee, McDowell proclaimed, is going to find out where the money comes from and what the hell is behind the scheme.

Well, we always like to help the Thomas Committee out. On best scientific authority we are able to advise it what the Congo project amounts to.

To show its gratitude for the financial support the Belgian government-in-exile got from the Congo during the war, Belgium decided to establish a laboratory and institute for study of tropical diseases and medicines in the Congo. The project is financed entirely by Belgium, on land under Belgian control, in an area rich in uranium belonging to the Belgians. In short, the project is an all Belgian affair and, like a lot of other things the Thomas Committee pokes its nose into, is none of its damn business.

[*Facts about the Belgian Congo project are told in SNL, Sept. 11, p. 167.*]

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GENERAL SCIENCE

House Committee Is Called "Inhumane"

➤ DR. LINUS PAULING, President-elect of the American Chemical Society, speaking at the St. Louis meeting, accused the House Un-American Activities Committee of "scorning humane and considerate treatment" in its inquiries.

He said witnesses, especially scientists, are "utterly without protection when the Thomas Committee takes hold." By way of contrast, Dr. Pauling said, the Atomic Energy Commission has handled the security problem "reasonably well."

Dr. Pauling, California Institute of Technology professor, said the commission has handled security cases which warranted dismissal without "unfair publicity" and with a chance for accused persons to defend themselves.

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Some natural gases used for fuel and lighting contain 10% or more of non-combustible *nitrogen;* scientists are now trying to find an economical way to take the nitrogen out before the gas is shipped to consumers by pipelines.

PSYCHOLOGY

You Inherit Old Age, Twin Study Reveals

➤ OLD AGE is inherited.

You can shorten your life by what you do or what happens to you in life, or by failing to take advantage of your constitutional potentialities. But you can't add one year to your limit of vital capacity, Dr. Franz J. Kallman, of the New York State Psychiatric Institute, told the American Psychological Association, meeting in Boston.

This conclusion is based on a study of 2,000 twins over 60 years of age. Not only is long life inherited, but also the ability to stay in good mental and physical health during all the period of senescence.

The likenesses between identical twin children, both in looks and personality, that make it hard for even their own parents to tell them apart, persist through old age, it was observed. They continue even when the twins are separated.

Old people cannot see as well on a dark night as younger men, Dr. James E. Birren, of Baltimore City Hospitals, told the same meeting. Dr. Birren compared 66 men aged 43 to 80, living in the Baltimore Infirmary, with 25 Navy enlisted men aged 18 to 23.

Some of the older men had structural defects which might account for the lack of dark adaptation. But others had no such defects.

Individual differences in the loss of ability to see in the dark are, however, great. The range for the older men is more than twice as great as for the younger men.

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PSYCHOLOGY

Faith in Future Runs High in American Youth

➤ FAITH IN THE FUTURE runs high in American youth of both high and low economic levels, with particular confidence expressed in the opportunities open for young people and success in marriage.

This is disclosed in a study by Dr. H. E. Jones, professor of psychology at the University of California, who tested 659 high school seniors from the same urban school in 1938, 1942 and 1947.

The psychologist asked for comments on 15 items on social and economic conditions and future prospects. There were four possible answers, two giving differing degrees of optimism and two reflecting pessimism.

Paradoxically, the greatest optimism occurred in the spring of 1942, when the subjects were facing the draft and when American military fortunes were at their lowest ebb in World War II. Optimism is still high, though not so high, generally, as in 1942.

On the statement, "There are actually a great many more opportunities today than ever before," 1 in 5 were in agreement in

1938, 9 out of 10 in 1942, and 1 in 2 in 1947.

On the subject of marriage, the youths were as optimistic in 1947 as in 1942. The conviction that "If people really want to, they can always establish a home and family without any great sacrifice, even in bad times" increased from 1938 to 1942 and remained strong in 1947.

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PSYCHOLOGY

Home Babies Are Brighter Than Ones in Institution

► EVEN young babies in a good institution do not score as bright on mental tests as do babies in a private home.

Two hundred infants from six weeks to 12 weeks old were given infant intelligence tests in a study reported to the American Psychological Association in Boston by Dr. A. R. Gilliland of Northwestern University. Half the babies lived in a good institution. Half are in private homes.

The average IQ of the institution babies was 97.5; that for those in private homes 109.5.

Apparently whether the parents are rich or poor does not have any effect on the mental development of such young babies. Those in the finest homes did not score higher than those in the poorest families.

The oldest child in a family tends to think differently from his younger sisters and brothers, the same meeting learned from Dr. Joan Kalthorn, of Fels Research Institute, Antioch College.

The first child in the family is likely to excel on abstract thinking. The younger child is superior on more realistic tasks. The younger child also tends to have a higher total intelligence score than his older brother or sister.

A possible explanation offered by Dr. Kalthorn is that the older child received more intellectual stimulation and companionship from adults. The younger child is less protected and has more freedom to explore and develop his own capacities.

Dr. Kalthorn studied 39 pairs of first and second children. They ranged in age from 30 months to 12 years.

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MEDICINE

Refuge from Hay Fever Possible in Park Areas

► IF YOU ARE seeking a refuge from your sniffles and sneezes during the hay fever season, go to the national parks of the Rocky Mountain, Cascade, Olympic, and Sierra regions.

Thirteen years of pollen testing have shown that these regions are excellent ragweed refuges, Dr. O. C. Durham of the Abbott Laboratories said in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Sept. 11).

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NEW LIGHT-WEIGHT "IRON LUNG"—This cat is breathing artificially in the new Yale cloth respirator. It was developed by Dr. Harold Lamport, left, and Dr. Ralph D. Eichhorn, right.

MEDICINE

Collapsible Cloth "Lung"

Polio patients would benefit from this inexpensive, light-weight respirator, if it can be produced commercially. Successful tests were made with a cat.

► PARALYZED polio victims may soon have available a cloth type of "iron lung" that is inexpensive and can be folded to fit into a suitcase.

This rubberized cloth respirator was tested successfully at Yale University on an experimental animal, its designers, Drs. Harold Lamport and Ralph D. Eichhorn, reported in the journal, SCIENCE (Sept. 10).

An experimental man-size model has been made for commercial use but several technical problems exist which the manufacturer must still solve. These are: how to provide proper portholes for patient care; how best to get a person in and out of the respirator; and whether to use it with a standard hospital bed or as a self-contained unit.

This new model uses the same principle as the "iron lung." It subjects the paralyzed patient to rhythmic negative pressure to help him breathe. It is cylindrical in shape and weighs less than two pounds when fully inflated.

Comparing its structure to a thermos flask, the doctors said it has air-tight inner and outer walls with sustained air pressure between. Partitions extend the length of the cylinder but are not attached at the ends so that air under pressure can be introduced from a single inlet.

The end where the head protrudes is sealed off by a plywood disk with a sponge-rubber neck piece. This contains tubes to measure the pressure and to permit evacuating the chamber. To induce the rhythmic respiration, standard methods such as bellows, diaphragm, or vacuum pump with a flexible hose, can be used.

They also designed another model made of plastic sheeting which has so far proved unsatisfactory. However, they feel that this one has considerable promise because of the possibility it offers of having a completely transparent respirator which would aid in nursing and medical care.

The idea for the respirator was conceived by Dr. Lamport when he was working at Yale during World War II on the pneumatic lever suit which prevents blackout of pilots maneuvering at high speeds.

Science News Letter, September 18, 1948

PHYSICAL MEDICINE

Civilian Amputees Lack Attention Given GI Cases

➤ THE FOUR war years produced 120,000 civilian amputees and 18,000 military amputees. Yet for this larger group of civilians there exists no such coordinated rehabilitation program as for the GIs, the American Congress of Physical Medicine was told at a meeting in Washington.

Inadequacy in preparing the civilian amputee for the life he must face when he leaves the hospital was described by Dr. Henry K. Kessler, director of the Hasbrouck Heights' Amputee Clinic at Newark, N. J.

These civilians must be provided proper facilities if they are to be absorbed into the national life, Dr. Kessler pointed out.

He suggested that an effective program of rehabilitation should embrace five phases. Psychologically, the amputee needs reassurance and preparation during convalescence for the period when he can use the artificial limb. Surgically, the 30 or 40 sites of amputation can now be reduced to four basic ones, permitting a better fitting of artificial limbs. After care of the stump should be aimed at preventing its becoming contracted, weak, or improperly shrunk. In the fitting of artificial arms or legs, the emphasis should be on comfort, correct length, correct alignment and durability. And lastly, the amputee must be taught to develop skill in using his artificial arm or leg.

Science News Letter, September 18, 1948

POPULATION

Heart Victim Not Harmed By Temperature Changes

➤ IF YOU HAVE heart trouble, stop worrying about going shopping or to a movie on a hot day because of the extreme change of temperature in air-conditioned places. This advice was given in a report to the American Congress of Physical Medicine in Washington.

Tests were made with ten healthy adult males and 21 men with heart trouble. There was no difference in their adjustment to a sudden change in temperature, Dr. Nathaniel Glickman, of the University of Illinois College of Medicine in Chicago, told the Congress.

Science News Letter, September 18, 1948

ELECTRONICS

Hearing Aids To Have Longer-Lasting Battery

➤ A NEW KIND of dry battery that is lighter and longer-lasting because it uses oxygen from the air, instead of from chemicals within it, was announced by Dr. Lauchlin M. Currie, research vice-president of National Carbon Company.

People who wear electronic hearing aids will be the first to benefit from this development. The new A battery weighs about an ounce and lasts 80 hours, three times as long as a slightly heavier cell it replaces.

"The new outfit offers the largest output of electrical energy in the lowest weight and volume ever delivered in a commercial battery," Dr. Currie explained.

No metal oxides are used as the depolarizing agent that keeps the battery from stalling. This effect is secured by using a highly-active carbon electrode that takes up oxygen from the air when the battery is unsealed for use. A paste around the electrode holds the necessary electrolyte which, in effect, is regenerated. The battery continues to operate until the pure zinc anode is used up in the chemical action that produces the electricity.

Use of the new type battery in larger installations, some of military importance, was predicted by Dr. Currie.

Science News Letter, September 18, 1948

GENERAL SCIENCE

Science Writing Award Winners Are Announced

➤ A MAGAZINE ARTICLE on old age and newspaper stories on a new antibiotic have won $1,000 George Westinghouse Science Writing Awards.

Florence Moog, of Washington University, received the magazine award for an article, "The Biology of Old Age," while the newspaper award was made to Frank Carey of the Associated Press, in Washington, for his stories on chloromycetin. Honorable mention in the magazine division went to a free-lance writer, Herbert Yahraes.

The awards were made during the centennial meeting in Washington of the American Association for the Advancement of Science.

Science News Letter, September 18, 1948

ASTRONOMY

New Comet Found In Southern Skies

➤ ANOTHER FAINT new comet has been discovered. In the far southern constellation of Sculptor, it is moving southwest.

This is the tenth comet spotted so far this year. Surprisingly, eight of the comets have been new objects and only two periodic comets whose return was expected.

Comet Johnson, of the thirteenth magnitude, was found on Sept. 1 by E. L. Johnson of the Union Observatory at Johannesburg, South Africa. News of this discovery was cabled by Dr. W. S. Finsen of the observatory to Mlle. J. M. Vinter-Hansen, well-known astronomer at Copenhagen. She forwarded the report to Harvard Observatory, American clearing center for astronomical discoveries.

Science News Letter, September 18, 1948

IN SCIEN

PSYCHOLOGY

Cocktail Makes Cringing Dog Stand Up for Himself

➤ A COCKTAIL will make even a cringing dog assert himself, Dr. W. T. James, of the University of Georgia, told the meeting of the American Psychological Association in Boston.

A litter of four Dalmatian-setter hybrids were studied by Dr. James. The one female was the boss of the family and was also the largest.

One little male pup, smallest of the litter, was the most submissive. He never got enough to eat unless he was fed by himself.

But a dose of .55 cubic centimeters of alcohol per kilo of body weight, if given to him eight or ten minutes before the dogs were fed, gave him the temporary courage to stand up for himself. This dose is comparable to a single "shot" of whisky for a 150-pound man.

Separate feeding soon brought the little dog up in weight until he equalled his two more dominant brothers. But his nature was still submissive. He still failed to get enough to eat if he had to compete with the others to get it.

Science News Letter, September 18, 1948

ENGINEERING

New Injection for Gas Boosts Auto's Power

➤ AN ALCOHOL-WATER injection for the gasoline in a car's engine, adapted from the wartime anti-detonant injection used in American warplanes, may give motorists more power and less "knock" on hills.

The injection fluid, called Vitol, and an auxiliary carburetor, the Vitameter, were demonstrated by the Thompson-Toledo Vitameter Corporation in Cleveland. In addition to improved car performance, the injections may mean a saving in fuel supplies, company officials pointed out.

Using the booster fluid has the effect of raising the gasoline's octane rating by 10 to 20 numbers, it was explained.

Vitol consists of 85% alcohol and 15% water, with tetraethyl lead and soluble oil. In wartime planes, 50-50 alcohol and water solution was used.

The Vitameter developed to give the booster "shot" operates only when the engine needs extra power, as in starting suddenly or in climbing hills. It can be installed in a car in less than an hour and will retail for approximately $30. Vitol, the injection fluid, is comparable in cost to motor oil, it was reported.

Science News Letter, September 18, 1948

E FIELDS

GENETICS

20,000 to 42,000 Genes Found in Each Body Cell

➤ YOU HAVE somewhere between 20,000 and 42,000 of the heredity-determining units, called genes, in each of the tiny cells which form your body.

This new estimate is made by Dr. J. N. Spuhler of Ohio State University.

Genes are invisible but important chemical groups. They determine such characteristics as your height and body type, the color of your hair and your eyes and the presence or absence of such inherited defects as bleeding and colorblindness. They may perhaps also determine such traits as literary genius or musical talent. Some of these traits are determined by a single gene. Others involve a number of genes acting together.

Dr. Spuhler reports his findings in the journal, SCIENCE (Sept. 10). He based his calculations on the known number and size of the chromosomes which carry the genes and studies of the genes of other organisms whose hereditary makeup is better understood than man's.

Science News Letter, September 18, 1948

METEOROLOGY

Different Species of Snow Produced in Laboratory

➤ VAPORS can be used to produce different types of snow in the laboratory.

Use of vapors to change snow from one type to another was disclosed by two General Electric scientists, Dr. Vincent J. Schaefer, who produced the first man-made laboratory snowstorm, and Dr. Bernard J. Vonnegut.

They used 30 different vapors in experiments with transforming snow into different shapes. Cold-chamber snow in the laboratory is usually in the form of hexagonal plates. The vapors changed the snow into four different, recognizable shapes, and other freak shapes which may be transitional stages between the other forms.

Science News Letter, September 18, 1948

GENERAL SCIENCE

Creativeness Endangered, Chemists' President Says

➤ ORIGINALITY and creativenes in American research is being endangered by transferring to scientific investigation the techniques employed in the mass production of goods, Dr. Charles Allen Thomas, executive vice-president of the Monsanto Chemical Co., St. Louis, charged in his presidential address to the American Chemicl Society meeting.

"Are we becoming nut-tighteners and wrench wielders on an assembly line of industrial and university Research?" Dr. Thomas asked. "Perhaps we have straightjacketed our imaginations within the confines of narrow disciplines and lost sight of the end products. We have failed to see the great difference between physical and intellectual production."

Dr. Thomas admitted that some specialization is necessary so that inquiry is not diffused over such a large field as to lose its effectiveness. He recalled that the Jack-of-all-trades is seldom master of any. Creative specialization must, he said, escape being as esoteric and fruitless as the ancient question of the number of angels on the head of a pin.

Science News Letter, September 18, 1948

PALEONTOLOGY

Discover Ape Bones Which Are Very Close to Human

➤ BONES of ancient African apes that seem to be closer to the human line of descent than any hitherto discovered were described before the meeting in Brighton, England, of the British Association for the Advancement of Science by Prof. W. E. Le Gros Clark. They indicate that the animals got about by walking and running, instead of swinging from branch to branch on overdeveloped arms with hook-like hands, after the quite un-human manner of the modern great apes.

Among the large and varied ape fauna of East Africa described by the speaker were some animals the size of modern chimpanzees, and others as big as present-day gorillas. Some of the fossils indicate a former land connection with Asia.

Science News Letter, September 18, 1948

AERONAUTICS

Largest Non-Rigid Airship Planned for Navy Patrols

➤ THE LARGEST, non-rigid blimp in the world will be built for the U. S. Navy by the Goodyear Aircraft Corporation.

The Department of the Navy revealed that a contract has been let for the "N" blimp. It will be nearly twice as large as the blimps used in World War II anti-submarine patrols and will be able to operate on long-range patrols.

Envelope of the new lighter-than-air craft will be 324 feet long, 71 feet wide and 92 feet high at its tallest point. A crew of 14 officers and men and two 800-horsepower Wright Cyclone aircooled engines will be housed in an 87-foot car under the envelope.

Rayon fabric coated with neoprene synthetic rubber will be used in the construction of the envelope which will have a capacity of 825,000 cubic feet of helium gas.

Science News Letter, September 18, 1948

GEOLOGY

Present U.S. Coast Was Once a Chain of Islands

➤ CHAINS OF ISLANDS were strung out along the present coasts of the United States, while the continent was about half the size it is now.

This is how America looked half a billion years ago, in the new theory proposed by a Columbia University professor.

Shallow seas and deep troughs bordered a central lowland. The volcanic island chains followed roughly the present borders of the continent. This picture of early Paleozoic North America was presented to the International Geological Congress in London by Prof. Marshall Kay, Columbia geologist.

Sometime during the Paleozoic era, Prof. Kay believes, the present limits of the continent were formed.

Study of rocks from the Atlantic and Pacific coasts have revealed fossils from that era. But the rocks have undergone great changes due to mountain-making movements during the Paleozoic.

Along the Atlantic coast, the early island chain stretched from Newfoundland to Georgia. It then curved westward along the northern edge of the Gulf of Mexico, into today's northern Mexico and back out to the modern Antilles. It finally reached into what is now northern South America. The Pacific chain extended from the Aleutians down through the coastal provinces and states, perhaps as far as the western Andes of modern times.

Science News Letter, September 18, 1948

NUCLEAR PHYSICS

U.S. Radio-Isotopes in Use In 21 Foreign Nations

➤ TWENTY-ONE foreign nations are now benefiting from the by-products of U. S. atomic energy in the form of radioactive isotopes. Their use ranges from tracing life processes to treating fatal diseases.

Already 216 isotope shipments have been made overseas since their export was authorized from the Oak Ridge National Laboratory last September.

Australia received the first consignment. It consisted of a small amount of radioactive phosphorus for use in treating polycythemia vera and leukemia. The first disease is marked by an excessive production of red blood cells and leukemia has been called "cancer of the blood." The Australians reported "good" results.

The 21 nations which have made formal arrangements to receive radio-isotopes are: Argentina, Australia, Belgium, Canada, Cuba, Denmark, France, Iceland, India, Ireland, Italy, The Netherlands, New Zealand, Norway, Peru, Spain, Sweden, Switzerland, Turkey, Union of South Africa and the United Kingdom.

Science News Letter, September 18, 1948

MINERALOGY

Air Makes Concrete Lighter

Taller and less expensive buildings are now possible with this new lightweight material, since it will eliminate much dead weight.

By MARTHA G. MORROW

See Front Cover

➤ CONCRETE is being made lighter these days simply by getting more air into it. Some is so light it floats on water.

Lightweight concrete makes possible taller and less costly buildings.

Designed to eliminate much of the dead weight in buildings, concrete made with such air-filled aggregate as expanded perlite and pumice weighs only a fraction as much as that employing the traditional sand, gravel and crushed stone.

Air also is whipped into the mortar. This is done by using air-entraining agents such as tallow and resin. Concrete made in this way is less affected by freezing and thawing.

Some air is normally trapped in concrete, ordinarily about one percent. That incorporating from four to six percent of air can more effectively resist disintegration caused by repeated freezing and thawing, studies at the National Bureau of Standards indicate.

Easily Molded

When air-entraining agents are used, the concrete can be molded much more easily and less water is needed in the mixture. Themselves water-repellent, they tend to make the particles in the concrete mix more uniformly. Such concrete, however, does not adhere to steel reinforcement quite as well as regular concrete.

The foaming agent can either be ground into the cement at the mill or be added at the time of mixing. Such materials as tallow, certain types of resins, lime stearate and waste liquor from sulfite paper mills have been used successfully.

Lightweight aggregate concrete also can be made more workable and more resistant to freezing and thawing by entrapping air. As much as 15 or 20% of air is incorporated.

The need for lightweight building materials was emphasized toward the end of the last century when building design changed from thick, heavy, load-bearing walls such as brick or stone to a framework of structural steel beams and columns with thin walls, and then to reinforced concrete.

Ordinary concrete such as you find in sidewalks and highways is heavy. Using sand and gravel as the aggregate, it weighs about 150 pounds per cubic foot. It can be made strong and durable, but there are many instances where such a heavy concrete is disadvantageous.

Concrete using a lightweight aggregate makes it possible without additional weight to construct higher buildings, or to add several stories to buildings already existing that could not safely support a greater weight. Also less structural steel is needed, so the total expense of the building can be cut enormously.

The term "lightweight" was first applied to concretes using expanded clay or shale as an aggregate. Such concrete weighed about 100 pounds per cubic foot. In recent years, however, a satisfactory concrete weighing as little as 25 to 50 pounds per cubic foot has been produced by using such mineral aggregates as expanded perlite and expanded vermiculite.

Concrete blocks using lightweight aggregates have many of the same characteristics, but in varying degrees. Most of them can be sawed and nailed like wood, and give good insulation against heat and sound.

Expanded vermiculite produces an excellent concrete for roofing or insulation, but possesses little structural strength. The mineral itself is a special type of mica that expands when heated. It has about a million extremely thin layers to an inch. Between each layer is a tiny amount of water. When flakes of the mineral are heated, the minute layers open out to about 15 times their original size.

To produce the golden bits of expanded vermiculite, the mineral is dried, ground and heated to about 1,800 degrees Fahrenheit for only four to eight seconds. Only recently has expanded vermiculite been used in lightweight concrete weighing one-third to one-sixth as much as regular concrete.

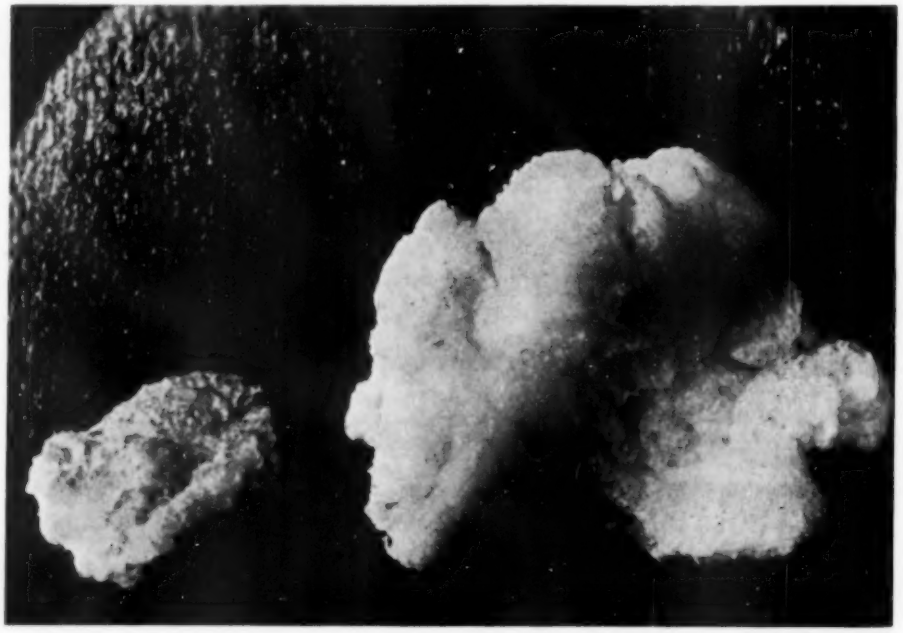
Vermiculite concrete is so light it floats on water, while concrete made with the traditional sand and gravel aggregate sinks, as shown on the cover of this week's SCIENCE NEWS LETTER.

Volcanic Glass

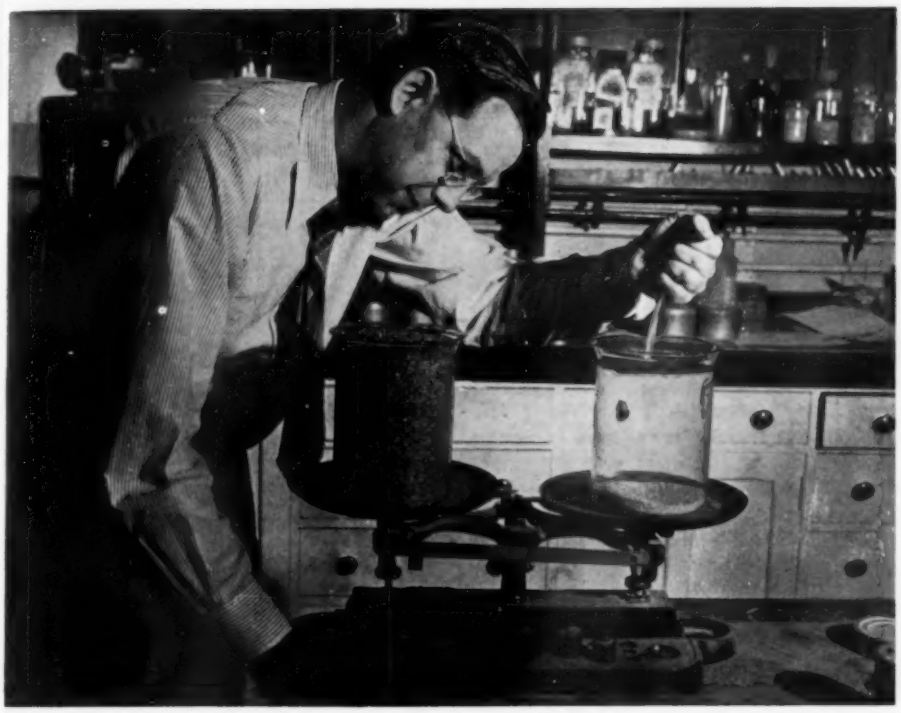
Expanded perlite, a natural volcanic glass, is used for a concrete with excellent insulating qualities. It is not considered well adapted, however, to construction where high strength is required. Concrete made from it weighs as little as 40 to 65 pounds per cubic foot.

Perlite usually is a soft pearl-gray in color. Although known for many years, its commercial production as a lightweight aggregate for plaster and concrete is relatively new.

Perlite is three-fourths silica, the principal constituent of sand. It is permeated with tiny pockets of entrapped water. When the mineral is crushed and heated



PUFFED MINERAL AIDS BUILDING—Perlite is mined as a compact mineral, as shown at left, but when it is ground and heated, water inside the rock forms steam which puffs it out (right).



EXPANDED MINERAL—Featherweight vermiculite, excellent for roofing or insulation, weighs only about a tenth as much as sand, being measured at right.

red-hot, the water turns to steam and puffs up the material so it contains minute air cells.

Nature put the air cells in pumice. Related to perlite in origin, this solidified froth was formed a little farther out from the volcanic core. Pumice is used to make a strong concrete weighing 60 to 90 pounds.

Pumice is the result of violent eruptions. The material from which it was created was almost completely liquid when forced out of the volcano. It cooled so fast that there was no time for the melted rock to crystallize. The vapors dissolved in it were suddenly released and the whole mass swelled up into a frothy mineral which hardened.

The use of pumice in building goes back to the days of the Romans. Fragments of pumice were employed as aggregate to reduce dead weight in many of the great domes such as the Pantheon and of the immense vaults of the public baths in Rome.

Slag, produced in the manufacture of pig iron, is cooled from the molten state with water to produce a sturdy, cellular material. The heat of the slag instantly turns the water into steam which, expanding enormously, puffs or "foams" the slag. Practically all of the water evaporates and the expanded slag incorporates only a small amount of moisture.

Foamed slag weighs only about half as much as does air-cooled blast-furnace slag. The concrete using it as an aggregate weighs approximately 80 to 100 pounds per cubic foot. In 1947 a million and a quarter tons of foamed slag were used for concrete.

Some types of clay, shale and slate are heat-treated to form a lightweight product. After being taken from the bank or quarry, the material is reduced to a proper fineness, then dumped into a rotary kiln. Here it softens to the consistency of chewing gum. As it is heated at a temperature greater than 2,000 degrees Fahrenheit, the material expands greatly.

This expanded material is one of the most widely-used lightweight aggregates. Created under intense heat, it is particularly good for use in concrete that may be subjected to extremely high temperatures.

Cinders, left from coal or coke that has

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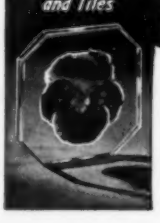

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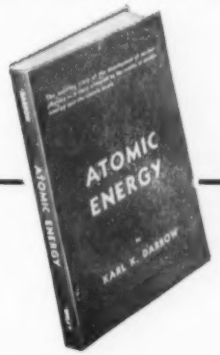

Do You Know?

The protein and mineral contents of *fishery foods* are equal to those of meat.

Ascorbic acid, which is vitamin C, may be added to fruits being canned in the home to prevent them from turning brown or developing an off flavor.

Tetanus, or lockjaw, is not caused by a rusty nail as many believe but by a germ that is often present in soils contaminated by the body wastes of cattle, horses and other animals.

The service life of *fence posts* of common non-durable woods can be doubled if they are treated before set in the soil with such preservatives as copper naphthenate, creosote, zinc chloride or pentachlorophenol.

The *highland flower mouse* is a rat-like rodent of Nepal, the Himalaya nation north of India; it lives in grass nests in hollows in decayed trees.

To the Person who is
DEAF
and is Tired of Straining to
HEAR

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been burned, are mixed with sand to form a concrete that weighs 35 to 40 pounds less per cubic foot than regular concrete.

Each lightweight aggregate has certain distinct characteristics. If insulation is the primary consideration, then expanded vermiculite is the choice. If insulation is important and some structural strength is required, then perlite is often preferred.

When great strength is essential as well as light weight, pumice, foamed slag, expanded clay and shale, or one of the other strong but air-filled aggregates will be called into service. Here the availability of the material may be the determining factor. Pumice, for instance, is widely used on the Pacific Coast, where it is found in certain volcanic regions. Foamed slag is popular in the East and Middle West, where large numbers of blast furnaces are located.

These and many other promising lightweight aggregates are being thoroughly tested as to insulation against heat and sound, strength, ability to withstand repeated freezing and thawing, and other important qualities. This is done by the National Bureau of Standards and the Bureau of Reclamation under the sponsorship of the Housing and Home Finance Agency. From such studies will result better office buildings, apartment houses and homes in the future.

A number of these lightweight extenders have been collected for you by Science Service. For the nominal fee of 50 cents you can receive specimens of expanded shale or clay, pumice, perlite ore and expanded perlite, vermiculite ore and expanded vermiculite. These are accompanied by a number of interesting experiments you can perform with the aggregates. Write Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the kit of lightweight aggregates.

Science News Letter, September 18, 1948

ASTRONOMY

Comet Ashbrook Brighter

► COMET ASHBROOK, spotted a few weeks ago in the constellation of Aquarius, the water carrier, is increasing in brightness. But it will probably never become bright enough for you to see without the aid of at least a small telescope.

The comet will make its closest approach to the sun next April 25, and will be nearest the earth the end of this month, calculates Dr. Allan D. Maxwell of Howard University, Washington. On Sept. 30 the head of the comet will come within 218,000,000 miles of the earth, he estimates; this is also the distance it will be from the sun on its nearest approach.

Now visible in the southeast, the comet was spotted on Aug. 26 by Dr. Joseph Ashbrook of Yale University Observatory while at the Lowell Observatory, Flagstaff, Ariz. It was of the 12th magnitude when found.

The comet will probably never become brighter than 10th or 11th magnitude, Dr. Maxwell says. It will reach its maximum brightness in March and April of next year, but at that time the sun will interfere with our seeing it.

Now 10 to 12 degrees north of the bright star Fomalhaut, the comet is moving so slowly that it will not leave the constellation of Aquarius until early next year. Just missing the constellation of Pegasus, the winged horse, it will swing into the constellation of Pisces the fishes, and on into Aries, the ram.

By the end of June it will be in the vicinity of the star Capella, of 0.2 magnitude and hence one of the brightest in the sky. During September of next year it will be in the constellation of Gemini, the twins. This is about as far north as it will get.

The best time to look for the comet is in the early morning hours, about one or two o'clock. On Wednesday, Sept. 22, it will be found at right ascension 22 hours, 48.8 minutes; declination negative 13 degrees, 39 minutes, Dr. Maxwell reports. On Thursday, Sept. 30, look for it at right ascension 22 hours, 42.2 minutes; declination minus 13 degrees, four minutes.

Science News Letter, September 18, 1948

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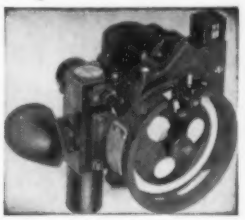

These Army Air Forces Bubble Sextants cost the Govt. about $125.00 each. A real bargain at our price of $12.50! Included with Bubble Sextant shipment is wooden Carrying Case, 5 spare waxed paper discs, flashlight with rheostat for night use (uses ordinary flashlight cells—not furnished) aux. 2-power Galilean Telescope, Allen wrench, 1 spare marking point. Wartime used, **BUT COMPLETELY REPAIRED, COLLIMATED AND PUT IN GOOD WORKING ORDER.** Light bulb has been tested—Bubble is in working condition. Because of wartime use, we make this guarantee: If not satisfied that Sextant is exactly as represented, return within 10 days and money will be refunded. Full directions for use accompany each shipment.

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Stock #10-Q—80 lenses ..... **$10.00 Postpaid**

Set #1-Q—"Our Advertising Special"—15 lenses for $1.60 Postpaid, plus 10-page idea booklet. For copying, ULTRA CLOSE-UP SHOTS, macrophotography, experimental optics, magnifying and for making a two power f/16 Telephoto Lens, "Dummy Camera," Kodachrome Viewer, DETACHABLE REFLEX VIEWFINDER for 35 mm camera, stereoscopic viewer, ground glass and enlarging focusing aids, TELESCOPES, low power Microscopes and for many other uses.

LENS CLEANING TISSUE—1st quality sheet size 11" x 7½". Made to Gov. spec. High wet strength. Free of abrasives.

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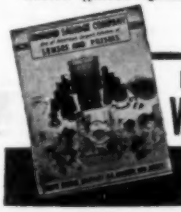

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PHYSIOLOGY

Save Muscles in Polio

➤ LOSS OF MUSCLE STRENGTH in victims of polio can be prevented by stimulating them with electrical current, the American Congress of Physical Medicine was told in Washington.

Good results with electrical stimulation treatment were reported by Dr. Stafford Osborne and Dr. A. J. Kozman, of Northwestern University Medical School, Chicago; Dr. Harry D. Bouman of the University of Wisconsin School of Medicine; and Dr. Andrew C. Ivy of the University of Illinois College of Medicine.

One group of patients treated had had polio ranging from six months to six years, while in the other group the electrical stimulation technique was begun immediately after diagnosis of the disease. Treatment was given daily for six days a week for an average period of nine months.

In both groups the doctors reported favorable results. In the patients who had polio the longest, the size of the treated muscles increased. In the new group of polio patients, muscle stimulation prevented their wasting away.

A "remarkable psychological effect" also resulted. Polio patients were encouraged to see and feel motion in muscles that they could not previously move. This aided their re-educational process.

The physicians recommend that the treatment should be started immediately after diagnosis of polio has been made.

Science News Letter, September 18, 1948

PSYCHOLOGY

Sex Criminals Prejudiced

➤ SEX CRIMINALS are more deeply prejudiced than are other prisoners against other races, religious groups, foreigners or other minority groups, Dr. William R. Morrow, of the Menninger Foundation, Topeka, Kans., found in a study of the hostilities of inmates of a state prison. Dr. Morrow reported his study to the American Psychological Association meeting in Boston.

At first, his study seemed to show no difference between other types of offenders in the extent of their intolerance toward minorities. More intensive study of 14 inmates, however, showed important differences in their motivation.

The crimes of the highly prejudiced prisoners were, without exception, desperate attempts to prove that they were "tough" and "he-men." They were attempts to act the badman by grabbing power, or were sex crimes against women which showed a hostile, exploitive character.

The crimes of those who have little prejudice against other races or religious groups are of a completely different sort. These men, with only one possible exception, seemed to be trying to find mothering or love. They were driven to their crimes by their failure to find the mother-like affection that they craved.

Science News Letter, September 18, 1948

Baby Mental Tests

➤ BABIES under six months old can be given baby mental tests to predict whether they will be bright when they grow older.

Later tests show that these predictions are actually better than was expected, Dr. Sibylle Escalona, of the Menninger Clinic, told the meeting.

The predictions were made to aid in the placing of babies for adoption and were based on 113 tests given to 51 babies.

Science News Letter, September 18, 1948

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Books of the Week

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CHINESE IDEAS IN THE WEST—Derk Bodde—*American Council on Education*, 42 p., illus., paper, 50 cents. An interesting introduction to the culture of a distant land. Many of our ideas were known very early in China; Cinderella (Sheh Hsien) lived there, complete with cruel stepmother, lost slipper and all.

GENERAL CYTOLOGY—E. D. P. De Robertis, W. W. Nowinski and Francisco A. Saez—*Saunders*, 345 p., illus., $5.50. A revision of a work originally published in Argentina in 1946, translated by Warren Andrew. Brings together the most important aspects of modern cytology.

HIGHWAY RESEARCH BOARD—PROCEEDINGS OF THE TWENTY-SEVENTH ANNUAL MEETING: Washington, D. C., December 2-5, 1947—Roy W. Crum, Fred Burggraf and W. N. Carey, Jr., Eds.—*Highway Research Board*, 523 p., illus., $7.50. Of interest to engineers, especially those concerned with road construction and maintenance and with soil mechanics.

THE LAND AND FRESH-WATER MOLLUSKS OF PUERTO RICO—Henry Van Der Schalie—*University of Michigan Press*, 134 p., illus., paper, $2.50. There are about 114 species of inland molluscan fauna, but only about a dozen are fresh-water forms. Some are disappearing with the changes made by man.

MINERALOGICAL AND STRUCTURAL EVOLUTION OF THE METAMORPHIC ROCKS — Francis J. Turner—*Geological Society of America*, 342 p., $3.00. Emphasizing the importance of regarding metamorphic, like igneous, rocks as products of chemical and physical evolution.

NEW TECHNIQUES OF HAPPINESS—Albert Edward Wiggam—*Wilfred Funk*, 352 p., $3.75. An inspirational type of book by a popular author.

OCEANOGRAPHIC OBSERVATIONS ON THE "E. W. SCRIPPS" CRUISES OF 1941—H. U. Sverdrup—*University of California Press*, 407 p., paper, $2.00. Data gathered on cruises undertaken to study hydrographic conditions and the distribution of sardine eggs and larvae off southern California.

PUBLIC ADMINISTRATION ORGANIZATIONS: A Directory of Unofficial Organizations in the Field of Public Administration in the United States and Canada, 1948—*Public Administration Clearing House*, 216 p., $3.50. Lists nearly 2,400 organizations with addresses and other data.

RAINFALL AND RUNOFF—Edgar E. Foster—*Macmillan*, 487 p., illus., $9.00. A comprehensive book for engineers and students of hydrology.

REPORT ON THE GREEKS: Findings of a Twentieth Century Fund Team Which Surveyed Conditions in Greece in 1947—Frank Smothers, William Hardy McNeill and Elizabeth Darbishire McNeill — *Twentieth Century Fund*, 226 p., illus., $2.50. A first-hand account of what is happening in a land troubled by anxiety and poverty.

SELF-ANALYSIS QUIZ FOR SUPERVISORS AND EXECUTIVES—Rexford Hersey—*American Management Association*, 24 p., paper, 25 cents. Would you make a good boss? This test is compiled by a member of the faculty of the University of Pennsylvania. Yes, answers are in the back of the book.

STUDENT'S HANDBOOK OF SCIENCE — Bernard Udane and Herman W. Gillary—*Ungar*, 208 p., illus., paper, 75 cents (60 cents each for ten or more). A book of useful information for high school students of science, especially members of science clubs.

VIKING FUND'S ACTIVITIES FOR THE YEAR ENDED JANUARY 31, 1948 — *Viking Fund*, 66 p., illus., paper, free upon request to publisher. Reporting on the year's activities in promotion of research in anthropology.

WHAT'S YOUR MANAGEMENT I.Q.? — Ellis H. Woolley — *American Management Association*, 12 p., paper, 20 cents. Intended to show the administrator or supervisor where he needs to strengthen his own knowledge.

Science News Letter, September 18, 1948

RADIO

Railway Coach Made into Mobile Ionospheric Lab

➤ A CONVERTED railway coach houses Canada's first mobile ionospheric observatory. It has just been put into operation by the Defense Research Board on the railroad to Fort Churchill.

Future broadcasts will probably reach you more clearly because of observations made with this traveling laboratory. Studies made in Manitoba, coordinated with those obtained by 63 other stations throughout the world, will help radio broadcasters select the best frequencies to use. They will also aid in making ionospheric storm warnings.

Canada is already operating a number of ionospheric stations in the north country, but this is the first fully mobile one. The lab will operate over the Hudson's Bay Railroad between Portage La Prairie and Churchill. One round-trip will be made every three months, with week-long stops at chosen locations on the rail line.

The zone of northern lights, which covers all of northern Canada, is highly suitable for such study of ionospheric conditions. Charged particles, emanating from spots on the sun, are deflected closer to earth by the earth's magnetic field in this region.

The new mobile ionospheric station will send radio beams as high as 200 miles above the earth. These are reflected back by the ionosphere. Based on information thus obtained about conditions in the upper air, future radio transmission conditions can be predicted and suitable frequencies for long distance radio communication selected.

Science News Letter, September 18, 1948

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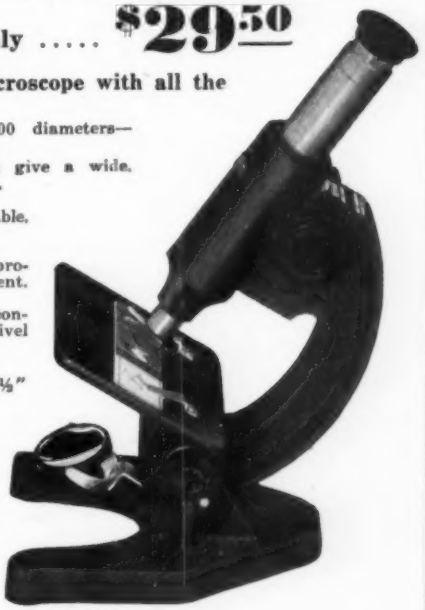

This is an American-made instrument—designed and produced by optical experts to exacting standards of quality and performance. Only modern production methods could bring this microscope to you at the low price of only $29.50.

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⚙ *TUMBLERS FOR ICED DRINKS, on the outsides of which moisture does not collect, look like glass but are made of a transparent plastic, and are double-walled with an air space between. This air space acts also as insulation, keeping the iced beverage cold longer as well as keeping the outer surface dry and warmer to the touch.*

Science News Letter, September 18, 1948

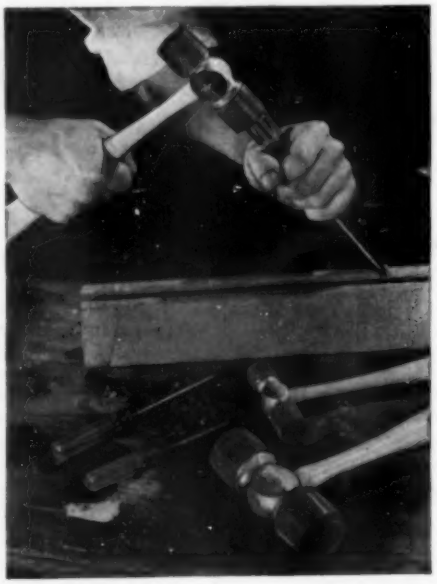
⚙ *PORTABLE CLOTHES DRIER, housed in a dress-suit-like case, contains an extensible rack of the ordinary hinged type, and an electric heating unit with fan fixed in the case. In use, the case is laid on the proper side, opened, the rack extended and the cord of the electric unit plugged in an ordinary electric outlet.*

Science News Letter, September 18, 1948

⚙ *ELECTRIC WATER HEATER for the home or laboratory has within it a magnesium rod to protect the tank itself from corrosion. Certain types of water that normally corrode and disintegrate tanks will, through electrolytic action, affect the magnesium rod instead.*

Science News Letter, September 18, 1948

⚙ *HAMMERS with plastic striking faces, which can be used without danger of marring surfaces of aluminum, other soft metals and highly polished wood, have the driving power of standard machinist hammers of equal weight. Their plastic faces, shown in the picture, are of a special vinylite and are fitted over drop-forged heads.*



Science News Letter, September 18, 1948

⚙ *BATHROOM TRAY fits under the closet tank and catches and drains off tank drippings sometimes produced by condensation of moisture on the outside of the flush water container. Made of steel and aluminum with a white enamel finish, it is easily inserted.*

Science News Letter, September 18, 1948

⚙ *RUBBER STALL, a band to be worn on thumb or finger by filing clerks when sorting papers or by bank clerks counting currency, is made of pure gum rubber with an aluminum adjuster to regulate size. It eliminates the need of wetting the thumb and, being a band, causes little if any sweating.*

Science News Letter, September 18, 1948

⚙ *UNICYCLE-RIDING tiny clown, with an aluminum drum on which it rides, has magnetic shoes which follow a revolving magnet inside the drum. A crank on the side of the drum, not only revolves the magnet but also operates a music box so that the clown rides to music.*

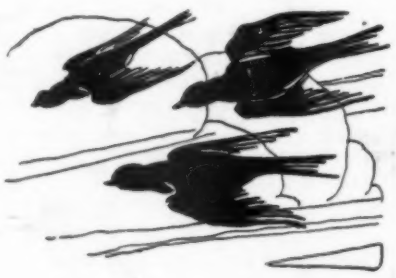
Science News Letter, September 18, 1948

• Nature Ramblings *by Frank Thone* •

► ANIMALS prepare their escapes from the hardships of winter in an astonishingly wide variety of ways. Literal flight from the region where cold and want will prevail is perhaps the most conspicuous of these evasive actions. The autumn migrations of birds and their return in spring have been watched with wonder by all peoples since the dawn of history—and presumably even before that. Other winged creatures have their migrations also, though less is known about them because of greater difficulties in observation. Vast flocks of butterflies are often seen winging their way southward in autumn—often to apparently sure death over the sea. Bats, too, are said to migrate at least short distances to the caves where they will hibernate.

Hoofed animals also migrate, though their movements are more likely to be in altitude rather than in latitude. Elk, moose, bighorn, mountain goats and other big-game species usually spend the summer months in the higher mountains and plateaus, where there are better pastures and fewer tormenting insects. When winter impends they come down into the valleys where there will be better shelter from storms and where shallower snows make movement and search for food less difficult. Some species also shift in latitude, notably the caribou and other animals of the sub-Arctic.

Flight From Winter



Hibernation is another common device. In varying degrees, it is used by animals ranging in size from mosquitoes to bears. The winter sleep of some is profound and almost death-like. Ground-squirrels and other small mammals are limp, cold to the touch, and insensitive to noises, shaking and even pin-pricks when dug out of their winter burrows. Bears, on the other hand, are likely to be rather light sleepers, coming out of their dens for short prowls during spells of mild weather.

There is as much variety in hibernation among insects as there is among larger animals. Queen bumblebees, for example, dig in as snugly as the fabulous ground-hog, and sleep as profoundly. A few butterflies, notably the beautiful mourning-cloak, merely cling in some chink of bark or tangle of twigs, and flit about when mid-winter thaws raise the temperature at which insects can be active. Other lurkers that make no special preparations for winter sleep are occasional flies, some mosquitoes, and many kinds of spiders. You are apt to see these creatures on the move at almost any time during the winter.

Science News Letter, September 18, 1948